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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,139	12/18/2000	Wei-Yung Hsu	AMAT/5614/CMP/RKK	4854

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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
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1763

12

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/739,139

Applicant(s)

HSU ET AL.

Examiner

Sylvia R MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 and 89-119 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 and 89-119 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al (USP 6,080,288) in view of Uzoh (US 6,066,030 known hereafter as Uzoh'030).

Schwartz teaches a system 10 which includes cell (partial enclosure) 12 includes a toroidally-shaped manifold 14 having an outlet 16 and a first inlet 18 and a second inlet 20. The first and second inlets 18 and 20 are coupled to a supply conduit 21. A diffuser 30 is positioned downstream of the outlets 16 of the manifold 24. The diffuser 30 (diffuser plate) has a plurality of openings 33 and, like the manifold 14. The anode basket 40, which is positioned downstream from the diffuser.

The cathode assembly includes a removable cassette 67 (substrate carrier) which holds a glass master 70 (substrate). Two electrical contacts 75 and 76 are disposed about the perimeter of substrate receiving surface.

The planarizer 50 has a rotatable plate 52 (permeable disc) made from plastic, non-conductive material, with a main opening 54 and a plurality of apertures 56 extending radially from the main opening 54 and a pipe or conduit 58 (shaft) coupled to the main opening 54 and extending out of the cell 12. The plate 52 of the rotary jet planarizer 50 is positioned downstream from the anode basket 40. A rotatable plate made from a plastic, non-conductive material.

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The planarizer 50 is coupled to a motor 60 (actuator) Figure 1 through a transmission 61. This causes circular rotation between the substrate and the permeable disk.

Schwartz fails to teach vertical and lateral movement.

Uzoh '030 teaches a polishing head 1 that is rotated, vertically moved, and laterally moved.

The motivation to move the polishing head in this fashion is to increase polishing pressure on the workpiece.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Schwartz to provide vertical and lateral movement of the substrate carrier as taught by Uzoh'030.

2. Claims 1,5,9,10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearson (USP 3,763,027) in view of Uzoh'030.

Pearson teaches a sparger 12 is mounted in a trough 17 which rests on a support 18. An outlet pipe 19 extends out from the bottom of the trough 17 and through the support 18. The sparger 12 (permeable disc) is held above the bottom surface of the trough 17 by two supports 21 and 22. The trough 17 and the supports 21 and 22 are constructed from materials, which are chemically inert in the electrolyte.

The anodes 32 and 33 extend from the bottom plate 23 through to the second, third, and fourth plates (diffuser plates) 24, 25 and 26 respectively, terminating slightly above the fourth plate 26. The sparger 12, as well as the plates 23 through 27, is made from inert nonconducting material. Electric power from power source 54 (electrical connection) is appropriately applied to

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the anodes 32 and 33 and the workpiece 10. The plate 25 acts in this way as a baffle. The fluid flowing through the scallops (grooves) 43, 44, 46, and 47.

Pearson fails to teach vertical and lateral movement.

Uzoh '030 teaches a polishing head 1 that is rotated, vertically moved, and laterally moved.

The motivation to move the polishing head in this fashion is to increase polishing pressure on the workpiece.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Pearson to provide vertical and lateral movement of the substrate carrier as taught by Uzoh'030.

3. Claims 4,5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szhwartz in view of Uzoh '030 or Pearson in view of Uzoh'030 in view of Uzoh et al (USP 6,261,426, known hereafter as Uzoh'426).

The teachings of Schwartz , Pearson, and Uzoh'030 were discussed above.

All fail to teach:

-the material of construction of the diffuser plate

-an anode below the diffuser plate

Uzoh '426 teaches an apparatus in Fig. 1 includes a cylindrical container or cup 14. Cup 14 has an inlet 2 through which electrolyte 6 enters cup 14 and flows upwardly toward substrate 12, constantly replenishing electrolyte bath 6a. Cup 14 also contains a counterelectrode 4 upheld by a support member 20. Interposed for bath flow control between counterelectrode 4 and target substrate 12 are baffle 8, supported by mounting bracket 18, and shield 10, supported by baffle 8.

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Both baffle 8 (diffuser plate) and shield 10 are comprised of a non-conductive material such as Teflon (fluoropolymers), PVDF or polyvinylchloride (plastic).

The motivation to construct the diffuser plate of resulting from the combination of Schwartz in view of Uzoh '030 or Pearson in view of Uzoh'030 with the materials taught by Uzoh'426 is that these are non-conductive and will not affect the electrical properties of the plate and thus affect the flow of materials through the plate. Similarly, the placement of the anode below the plate allows for better control of electro-deposition onto the substrate.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the system of Schwartz in view of Uzoh'030 or Pearson in view of Uzoh '030 with the material of construction for the diffuser plate and place the anode below the diffuser plate.

4. Claims 15-17, 22, 26, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz and Uzoh '030 in view of Cheung et al (USP 6,258,223).

The teachings of Schwartz and Uzoh'030 were discussed above.

Schwartz and Uzoh'030 fail to teach multiple processing stations.

Cheung illustrates in Fig. 3 an electroplating system platform 200 comprises a loading station 210, a plurality of processing stations 218. Each processing station 218 includes one or more processing cells 240. Substrate orientor 230 acts as a substrate transfer device. Figure 6 illustrates an electroplating process cell 400, the substrate holder assembly 450 is positioned above the process kit 420. The process kit 420 generally comprises a bowl 430, a container body 472, an anode assembly 474 and a filter 476. The container body 472 is preferably comprised of

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an electrically insulative material, such as ceramics, plastics, acrylic, lexane, PVC, CPVC, and PVDF.

The motivation to utilize the apparatus of Schwartz and Uzoh'030 in the multichamber stations of Cheung is to provide faster throughput and provide a means of processing many substrates at once.

Thus, it would have been obvious at the time of the claimed invention to combine the teachings of Schwartz and Uzoh'030 with those of Cheung.

5. Claims 15, 19, 22, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearson and Uzoh'030 in view of Cheung et al (USP 6,258,223).

The teachings of Pearson and Uzoh'030 were discussed above.

Pearson and Uzoh'030 fail to teach multiple processing stations.

Cheung illustrates in Fig. 3 an electroplating system platform 200 comprises a loading station 210, a plurality of processing stations 218. Each processing station 218 includes one or more processing cells 240. Substrate orientor 230 acts as a substrate transfer device. Figure 6 illustrates an electroplating process cell 400, the substrate holder assembly 450 is positioned above the process kit 420. The process kit 420 generally comprises a bowl 430, a container body 472, an anode assembly 474 and a filter 476. The container body 472 is preferably comprised of an electrically insulative material, such as ceramics, plastics, acrylic, lexane, PVC, CPVC, and PVDF.

The motivation to utilize the apparatus of Pearson and Uzoh'030 in the multichamber stations of Cheung is to provide faster throughput and provide a means of processing many substrates at once.

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Thus, it would have been obvious at the time of the claimed invention to combine the teachings of Pearson and Uzoh'030 with those of Cheung.

6. Claims 6, 11, 12, 20, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz in view Uzoh'030 or Pearson in view of Uzoh'030 in view of Talieh (USP 6,176,992).

The teachings of Schwartz in view Uzoh'030 and Pearson in view Uzoh'030 were discussed above.

Both fail to disclose the material of construction of the permeable disk or anode.

Similarly, they both fail to teach that the anode contacts the permeable disk.

Talieh teaches a mechanical pad assembly 12 disposed in a container (partial enclosure)

20. The mechanical pad 12 includes an anode plate 30 that is made of a porous or solid conductive material (consumable). A mechanical pad 32 (permeable disk) is mounted (is in contact with) onto the face of anode plate 30. Pad 32 is made of a nonconductive porous material such as polyurethane.

The motivation to construct the components of the systems of Schwartz in view Uzoh'030 or Pearson in view Uzoh'030 with materials taught by Talieh is that these would not interfere with the desired physical/chemical properties of the process result. Similarly the anode contacting the permeable disk ensures that the disk is electrically grounded.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Schwartz in view Uzoh'030 of Pearson in view Uzoh'030 with those of Talieh.

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7. Claims 18, 21, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz and Uzoh'030 or Pearson and Uzoh'030, in further view of Cheung.

The teachings of Schwartz, Pearson, and Uzoh'030 were discussed above.

All fail to teach Pearson fails to teach multiple processing stations.

Cheung illustrates in Fig. 3 an electroplating system platform 200 comprises a loading station 210, a plurality of processing stations 218. Each processing station 218 includes one or more processing cells 240. Substrate orientor 230 acts as a substrate transfer device. Figure 6 illustrates an electroplating process cell 400, the substrate holder assembly 450 is positioned above the process kit 420. The process kit 420 generally comprises a bowl 430, a container body 472, an anode assembly 474 and a filter 476. The container body 472 is preferably comprised of an electrically insulative material, such as ceramics, plastics, acrylic, lexane, PVC, CPVC, and PVDF.

The motivation to utilize the apparatus of constructed from the combined teachings of Schwartz or Pearson, and Uzoh'030 in the multichamber stations of Cheung is to provide faster throughput and provide a means of processing many substrates at once.

Conclusion

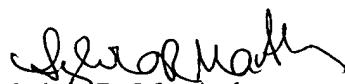
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690. The examiner can normally be reached on M-F during the core hours of 8 a.m. and 2 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the

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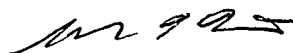
organization where this application or proceeding is assigned are 703-872-9630 for regular communications and 703-872-9630 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Sylvia R. MacArthur

April 7, 2003



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